

**Allancastria cerisyi GODART, 1822 in the Balkans:
New subspecies and critical notes on the existing populations**

(Lepidoptera, Papilionidae)

by

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Riassunto: Gli autori revisionano gli esemplari di *Allancastria cerisyi* delle proprie collezioni nonché di altre, pubbliche e private, provenienti da Bulgaria, Albania, Grecia, Romania e Jugoslavia, e descrivono *Allancastria cerisyi dalmacijae* subsp. nov. e *Allancastria cerisyi huberi* subsp. nov. comparandole con le altre popolazioni balcaniche. Per confermare le peculiarità delle popolazioni dalmate, presentano i risultati di incroci tra maschi e femmine della nuova sottospecie ed i corrispettivi della ssp. *ferdinandi*.

Abstract: The authors, having checked significant material from the Balkans, in their own and other public and private collections, describe and name, as new subspecies, *Allancastria cerisyi huberi* and *Allancastria cerisyi dalmacijae*. The new subspecies are compared with other Balkan populations, and the results of crossing males and females of *A. cerisyi dalmacijae* and *A. cerisyi ferdinandi* are presented.

Introduction

Taking a hint from recent works of KOUTSAFTIKIS, SCHMIT and SIJARIC the authors, thanks to the help of some colleagues, have succeeded in examining a great deal of material of *Allancastria cerisyi* coming from the Balkans. Such an examination led them to conclude about the existence of two hitherto unnamed, well differentiated subspecies of this species in the considered area.

To indicate wing veins and spaces between them, we will use COMSTOCK system (COMSTOCK, 1918).

Allancastria cerisyi dalmacijae subsp. nov. (colour plate II, fig. 7)

Holotype ♂: Makarska, Dalmatia, Croazia, 21.V.89, in coll. SALA, Salò (BS), Italy.

External characters. Head: frons black with yellowish tufts, palpi yellowish with the distal third black. Antennae: black. Thorax: dorsally black with yellow tufts, laterally and ventrally yellowish. Abdomen: dorsally black, ventrally yellow, laterally orange, with a superior line of yellow streaks intercalated by black from segments 5–8; up a row of white dots. Valvae: black with yellowish dots. Forewing length: 29 mm. Upperside FWs: the black marginal band is narrow, the submarginal band consisting of six dots, uniformly black coloured, not

merged together, those in ceR4-ceR5-ceM1 being oval shaped, while others in ceM2-ceM3-ceCuA1 are very small; cellular black spots are small, the postbasal and postmedian ones only slightly marked. Discal spots in ceCuA1-ceCuA2 are not as large as in ssp. *ferdinandi*. Underside FWs: cellular and discal spots as on recto. Submarginal spots and marginal bands unmarked. Upperside HWs: the black submarginal spots in ceCuA2-ceCuA1-ceM3 are small, in ceM2 formed by few black scales. Red dots nearly vanishing, few red scales in ceCuA1 and ceM3. The anal red spot is small and rounded. The subcostal red mark is as in other subspecies. Black anal band not intruding the cell; cellular area totally yellow, except for the black basal fifth. Discal spot in ceCuA2 small, that in ceCuA1 reduced to a small dot. Underside HWs: same pattern as on upperside, but complete row of red submarginal spots, discal spots enlarged and outer third of third of cell with blackish stripes.

Paratypes: 8 ♂♂, Makarska, Dalmatia, V.88; 3 ♂♂, idem, V.89; 3 ♂♂, idem, V.90, in coll. SALA, Salò (BS); 3 ♂♂, idem, 15.V.1990, in coll. FORTE, Torino; 2 ♂♂, idem, V.88, in coll. BOLLINO, Lecce.

Forewing length of male paratypes: 24–32 mm.

Female paratypes (colour plate II, fig. 8). Surely a highly characteristic female, being the smallest in Balkan populations, with ochreous yellow ground colour.

Upperside FWs: the black marginal area is extended so as to completely circumscribe a series of ochreous yellow submarginal spots, the four most apical ones are very small, while the remaining ones are a little larger with the distal edge rounded, and not sharpened; the black subcostal stripe is very narrow, the discocellular one is, on the contrary, very large; the postmedian and postbasal cellular stripes cross the cell to reach the inner edge; the discal area is very dark, with postbasal and postmedian black stripes joining the cell to anal margin.

Upperside HWs: the tails are completely black, except for few ochreous scales along the vein; the marginal dots are very thin, and well separated from the submarginal yellow streaks; the black submarginal band is very large and nearly surrounding the complete row of submarginal red spots; a few scaled black submarginal dots in ceM1; discal black spots small, the one in ceM3 usually absent, that in ceM1 small; black cellular stripes very faintly marked. Underside of both wings: as in male, but ground colour greyish yellow.

Paratypes: 1 ♀, Makarska, Dalmatia, V.87; 16 ♀♀, idem, V.88, 3 ♀♀, idem, V.89; 3 ♀♀, idem V.90, in coll. SALA, Salò (BS); 3 ♀♀, idem, 15.V.90, coll. FORTE, Torino; 1 ♀, idem, V.88, 1 ♀, idem, V.89, in coll. BOLLINO, Lecce.

Forewing length of female paratypes: 23–32 mm.

Paratype variations: both males and females in our series are quite constant in pattern.

Derivatio nominis: the name of the new subspecies clearly indicates its chorology, to underline its geographical position.

Allancastria cerisyi huberi subsp. nov. (colour plate III, fig. 9)

Holotype ♂: Greece, Florina, mt. 900, 15.V.87, in coll. BOLLINO, Lecce.

External characers: as in *Allancastria cerisyi dalmacijae* subsp. nov. Upperside FWs: marginal black band large, reaching CuA2, with marginal yellow spots well marked; sub-marginal row of black spots complete, the four most apical ones are large and merged together, those in ceM2 and ceM1 separated, rounded and suffused with yellow scales, those in ce1A-ceCuA1-ceCuA2 are reduced to very small dots with few black scales. Sub-costal black spot triangular, with base at the costal vein; three discal spots, those in ceCuA1 and ceCuA2 are larger, that in ce1A is reduced to a small dot. Cellular spots well marked, the median one reaches nearly to the inner edge of the cell. Underside FWs: Black pattern represented only by cellular and subcostal spots, and discal ones in ceCuA1 and ceCuA2. Upperside HWs: the marginal and submarginal rows of black spots are complete; the submarginal red spots are well marked in ceCuA2-ceCuA1-ceM3-ceM2, with a thin inner edge of black scales. The anal red spot is surrounded by black scales, touching CuA2 and the anal black band is well marked and contrasts well with the ground colour, intruding the cell. The series of discal spots are complete, and that in ceCuA2 is large, all the others are reduced to dots. The subcostal red mark is as in other subspecies. Underside HWs: as on recto surface, but the blackish stripes occupy the distal third of cell. Forewing length: 30 mm.

Paratypes: 9 ♂♂, same data as holotype, in coll. BOLLINO, Lecce; 2 ♂♂, idem, in coll. Sala, Salò (BS); 30 ♂♂, idem, in coll. HUBER, Scharthen (Austria); 16 ♂♂, idem, in coll. AUMAYR, Wels (Austria).

Forewing length of the male paratypes: 28–31 mm.

Female paratypes (colour plate III, figs. 10–12).

Upperside FWs: the ground colour is light yellow; the black marginal area is extended as in *dalmacijae* subsp. nov., but the submarginal yellow spot is larger, especially in ce1A-ceCuA2-ceCuA1-ceM3, with sharpened distal edge. Black subcostal and cellular stripes are nearly all of equal size, except for the median one being larger. The postbasal and postmedian cellular stripes cross the cell reaching the inner edge, and the latter merging with the discal band, thus joining the costal edge to anal margin. Discocellular band merged with discal spot in ceCuA1. Discal spots in ce1A and ceCuA2 are well marked. The postbasal and discal ground colour is highly suffused with dark scales. Upperside HWs: tails short and black; marginal fringes deep yellow; submarginal black band is well developed; the submarginal red spots present in ceCuA2-ceCuA1-ceM3-ceM2; the red anal spot totally steeped in black field; discal row of black spots from ceCuA2 to ceM1, those in ceCuA1-ceM3-ceM2 being smaller, and that in ceM1 big and oval shaped. The anal band intruding the cell; the distal third of the cell has blackish stripes. The underside of both wings is as in the male, but the ground colour is deeper yellow.

Paratypes: 10 ♀♀, same data as holotype, in coll. BOLLINO, Lecce; 2 ♀♀, idem, in coll. SALA, Salò (BS); 30 ♀♀, idem, in coll. HUBER, Scharthen (Austria); 16 ♀♀, idem, in coll. AUMAYR, Wels (Austria).

Forewing length of the female paratypes: 29–31 mm.

Paratype variation: the type series is very constant in size and pattern, except for the presence of rare specimens (2 ♀♀ and 5 ♂♂) with yellow instead of red submarginal spots on HWs. Such a form is also rare in other subspecies.

Derivatio nominis: the new subspecies is named in honour of our Austrian friend Ing. KURT HUBER from Scharthen, who generously provided us with valuable material from his own collection.

Differential diagnosis

Allancastris cerisyi dalmacijae: A constant character is the lack of the black discal spot of HW in space ceCuA1 and ceM1 in 98% of the males, while they are usually present in specimens of the ssp. *ferdinandi* and *mihljevici*. No black stripes in the cell of the hindwing, being present in 50% of specimens in *cerisyi mihljevici* and *cerisyi ferdinandi* (nearly all eastern Greek specimens provided with such stripes). The female can be easily distinguished by the ochreous-yellow ground colour present in all of the examined specimens except one, and black scaling highly enlarged. The yellow submarginal band of forewings is usually separated from the discal one being formed by small spots with rounded distal edge, while in *c. ferdinandi* and *c. mihljevici* the bands are merged together, with free inside black spots, and sharpened distal margin. The discocellular black band larger is than in the two other subspecies; the distal black cellular band is complete and reaches to the inner border of the cell and joins with the black discal band, while in contiguous subspecies it is short and does not touch the inner edge of the cell. The hindwings have a wide black marginal band enclosing the yellow submarginal spots, these being always separated from the marginal ones, while in *ferdinandi* and *mihljevici* they are merged together. The cellular black stripes are feebly marked, while they are better scaled in the other two compared subspecies.

Allancastris cerisyi huberi: The males have the submarginal black band of forewings always complete, even though spots in ce1A-CuA1-CuA2 are frequently reduced to a few black scales, while in *ferdinandi* the band always finishes with a spot in ceM3. The anal red spot of the hindwing always connects the anal vein to CuA2 (it never touches that vein in other subspecies). Females are highly quaint, with light yellow ground colour totally suffused by black scaling on forewings, while in *ferdinandi* it is nearly always pure yellow. The submarginal black band of the forewing is complete and connects the costal margin to the anal edge, isolating the submarginal yellow spots. Similarly, the distal black band of the cell is complete and joined to the discal band, thus again connecting the costal edge to the anal vein.

Both bands are usually incomplete in *ferdinandi* females, or, if seldom complete, not as starkly scaled black. The hindwings have a very wide submarginal black band with a red submarginal spot almost totally enclosed by it, a character rarely found in the *ferdinandi* female, where red spots at the most touch the black band with the distal edge.

Genitalia

The male genitalia did not show any relevant difference in the many dissected specimens coming from both type localities (Dalmatia: Makarska and Greek Macedonia: Florina), compared with specimens from Bulgaria (Kresna), Western Macedonia (Skopje and Demir Kapija), Albania (Tirana) and Greece (Nea Apollonia and Mt. Phalakron).

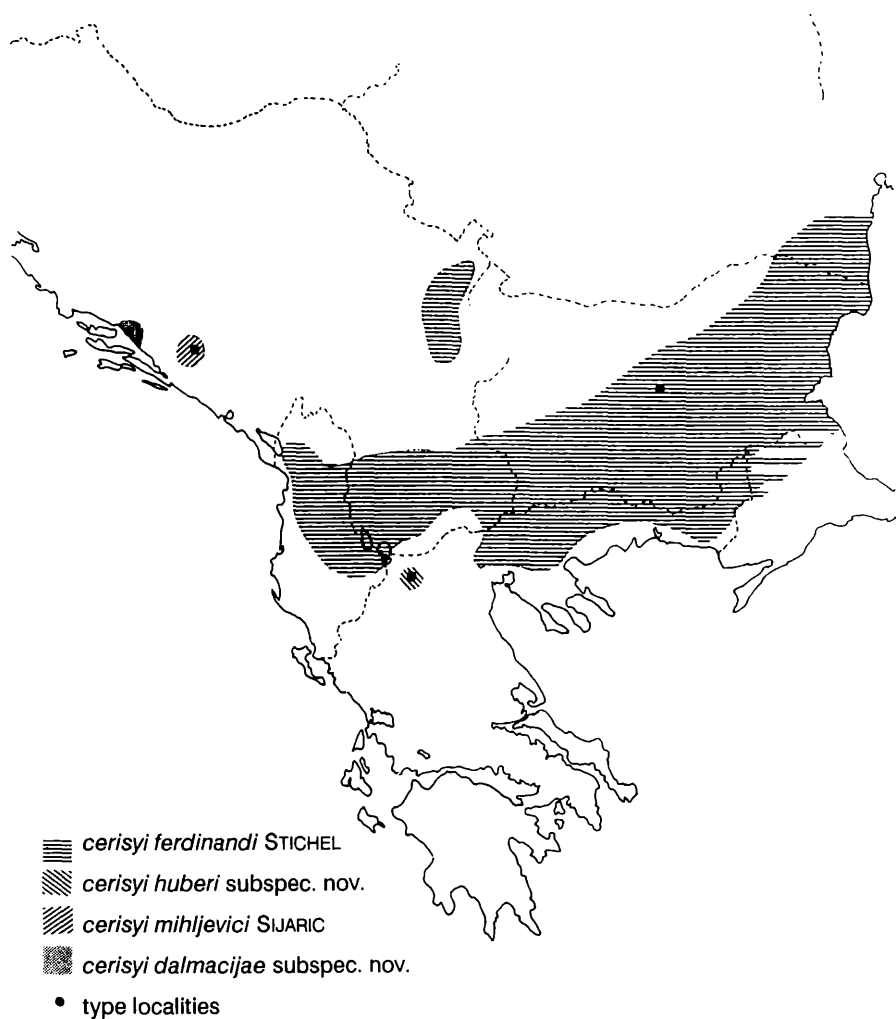
Distribution (cf. map)

Allancastris cerisyi dalmacijae, as far as we know, is restricted to coastal areas near to the town of Makarska, and no other similar populations have been found nearby.

Allancastris cerisyi huberi was collected on the hills surrounding the town of Florina. A collector informed us that similar specimens were collected near to Lake Kastoria, about 15 km south of the type locality, but we do not consider this information as reliable as we could not see or verify any specimen. Thus we only report it here, in the hope that we will be able to personally check the material from such a locality in the future.

Discussion

Allancastris cerisyi dalmacijae subsp. nov. is the westernmost population in the Balkans, located in the Dalmacija region near to the town of Makarska, on the Adriatic Sea. The influence of the mediterranean climate can be used to explain the peculiar female phenotype, which is very similar to the typical subspecies inhabiting the West coast of Turkey and Samos Island, with a similar climate. Since the publication by STICHEL (1907) with the description of *Allancastris cerisyi ferdinandi*, until the work of SIJARIC (1990) with description of *Allancastris cerisyi mihljevi*, all the Balkan populations of this species were considered as belonging to ssp. *ferdinandi* (type locality: Bulgaria). Now, owing to significant material in the authors' collections and more specimens seen both in other public and private collections, it is possible to better clarify the systematics of all populations. Ssp. *ferdinandi* was first described and named by STICHEL in 1907 from a small series of one male and four females coming from Schipka Pass, Bulgaria, and Romania; the original male is fairly typical of this subspecies and matches very well with long series in our collections; the female illustrated in the original description fits well with all other specimens seen, except for the discal black spots of the forewing running together with the subdiscal ones as they form a unique strip ceM2/M3, M3/Cu1, Cu1/Cu2, Cu2/A2. In our experience, no one of the compared females from Bulgaria, Romania, Greece and former Yugoslavia have this character (colour plate II, figs. 1–6). The recently described *Allancastris cerisyi mihljevi* SIJARIC from Hercegovina is similar to ssp. *ferdinandi* judging from the poor pictures of the original paper, and from the critical comment of the text. SIJARIC compared populations from Kosovo, Serbia, Macedonia and retained them as *ferdinandi*, saying that the basic colour is ochreous yellow as in *ferdinandi*, but in tens of examined males we have found only few a specimens with this character, mainly originating from Bulgaria, North-Eastern Greece, Albania and Romania, being pale yellow like ssp. ssp. *mihljevi*; also females are similar, except for the black bars of the forewing a little more complete and the discal spots of hindwing a little smaller. About the red spots of the hindwing, it is not true that at all that they are pale (brick) in *ferdinandi*; to the contrary, in the original description by STICHEL, they are reported as "kräftige rote Flecke", and in all specimens they are bright red and large. In spite of an incomplete and sometimes contradictory description, we provisionally retain *Allancastris cerisyi mihljevi* SIJARIC as a valid subspecies.



Allancastria cerisyi huberi subsp. nov. is probably one of the best differentiated subspecies within the whole species. It shows so many constant characteristic features as to enable us to distinguish it immediately within a long series of mixed specimens coming from different localities. Such strong differentiation is frequently found in marginal populations, especially if no genetic exchange is possible with nearby populations. Few and scattered populations of this species are reported from northern Greece, all located in North-Eastern Greek regions, like the classic Drama area, or the recently discovered population near Nea Apollonia (HECQ, 1992). The species is more widespread in the southern Yugoslav regions (compare distribution map in SCHÄIDER & JAKSIC, 1989). Although nearby populations are present in such area (like near Struga and Bitola), and also in Albania (like near Korçë), wild collected specimens from these localities can be identified as true *cerisyi ferdinandi*, suggesting the existence of one or more unknown ecological barrier(s) isolating *A. cerisyi huberi* subsp. nov. from the nearby subspecies. Both *Allancastria cerisyi dalmacijae* and *cerisyi huberi* females were found ovipositing on *Aristolochia clematidis* L. Judging from the recent paper by NARDI (1991) on Greek Aristolochiaceae of the genus *Aristolochia*, *clematidis* has its westernmost limit near Kalambaka, just south of Florina, having its largest distribution in Anatoliki Macedonia, Ditiki Macedonia and Thessalia, from where populations of *Allancastria cerisyi* were more frequently reported.

Breeding experiments

We think it is interesting to report here the results of crossing experiments that we obtained between specimens of *Allancastria cerisyi dalmacijae* subsp. nov. and *Allancastria cerisyi ferdinandi* from Thraki. The hand-pairing technique was used and oviposition was obtained on potted plants of *Aristolochia clematidis* L. in an outdoor cage. We paired a male from Thraki with a female from Makarska (crossing 1) and a male from Makarska with a female from thraki (crossing 2).

Crossing 1. 4 ♂♂ and 16 ♀♀ emerged. All females have an ochreous-yellow ground colour (even if not as vivid as in *c. dalmacijae* ♀♀), suggesting that this pattern is dominant in the wild population. Moreover, the distal black cellular band of forewings is complete (as in ssp. *dalmacijae*) in 12 specimens and near to complete in the remainder. Hindwings have small black discal spots (similar to ssp. *dalmacijae*) and the black cellular stripes feebly marked are other features of female hybrids. They have a medium size intermediate between *c. dalmacijae* and *c. ferdinandi*. Males have black discal spots on the hindwings smaller than in *c. dalmacijae* and medium size as in *c. ferdinandi* (colour plate III, figs. 13, 14).

Crossing 2. We obtained 7 ♂♂ and 6 ♀♀. All ♀♀ show a light yellow ground colour (as in *c. ferdinandi*), but smaller black discal spots on the hindwings. ♂♂ have black discal spots of hindwings smaller and lacking of dots in ceCuA1 and ceM1 (a character we consider as being diagnostic for *cerisyi dalmacijae*). The medium size of specimens approached that of *c. ferdinandi* (colour plate III, figs. 15, 16).

On the basis of these results we conclude that some characters of *Allancastria cerisyi dalmacijae* subsp. nov. are constant and peculiar, being probably coded by a dominant gene.

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Colour plate II (p. 421)

- Fig. 1: *Allancastris cerisyi ferdinandi* ♂, Bulgaria, Kresaq
- Fig. 2: *Allancastris cerisyi ferdinandi* ♀, Bulgaria, Kresaq
- Fig. 3: *Allancastris cerisyi ferdinandi* ♂, Macedonia, Demir Kapija
- Fig. 4: *Allancastris cerisyi ferdinandi* ♀, Macedonia, Demir Kapija
- Fig. 5: *Allancastris cerisyi ferdinandi* ♂, Greece, Thrace, Souflion
- Fig. 6: *Allancastris cerisyi ferdinandi* ♀, Greece, Thrace, Souflion
- Fig. 7: *Allancastris cerisyi dalmacijae* subspec. nov., holotype ♂
- Fig. 8: *Allancastris cerisyi dalmacijae* subspec. nov., paratype ♀

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Colour plate III (p. 423)

- Fig. 9: *Allancastris cerisyi huberi* subspec. nov., holotype ♂
- Fig. 10: *Allancastris cerisyi huberi* subspec. nov., paratype ♀
- Fig. 11: *Allancastris cerisyi huberi* subspec. nov., paratype ♀
- Fig. 12: *Allancastris cerisyi huberi* subspec. nov., paratype ♀, yellow form
- Fig. 13: *Allancastris cerisyi* hybrid ♂: *ferdinandi* ♂ from Alexandropoulos x *dalmacijae* ♀
- Fig. 14: *Allancastris cerisyi* hybrid ♀: *ferdinandi* ♂ from Alexandropoulos x *dalmacijae* ♀
- Fig. 15: *Allancastris cerisyi* hybrid ♂: *dalmacijae* ♂ x *ferdinandi* ♀
- Fig. 16: *Allancastris cerisyi* hybrid ♀: *dalmacijae* ♂ x *ferdinandi* ♀.

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Colour plate II

SALA, G. & M. BOLLINO: *Allancastris cerisyi* GODART, 1822 in the Balkans: New subspecies and critical notes on the existing populations (Lepidoptera, Papilionidae). *Atalanta* **25**(1/2):151 – 160.

Fig. 1: *Allancastris cerisyi ferdinandi* ♂, Bulgaria, Kresnaq

Fig. 2: *Allancastris cerisyi ferdinandi* ♀, Bulgaria, Kresnaq

Fig. 3: *Allancastris cerisyi ferdinandi* ♂, Macedonia, Demir Kapija

Fig. 4: *Allancastris cerisyi ferdinandi* ♀, Macedonia, Demir Kapija

Fig. 5: *Allancastris cerisyi ferdinandi* ♂, Greece, Thrace, Souflion

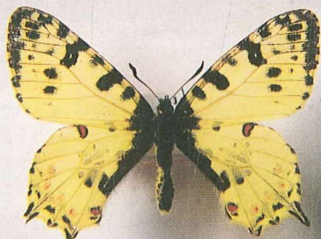
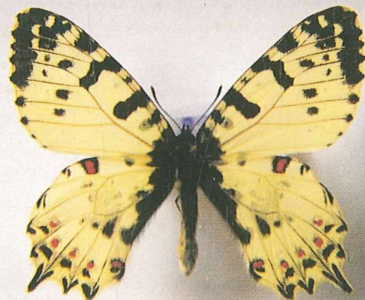
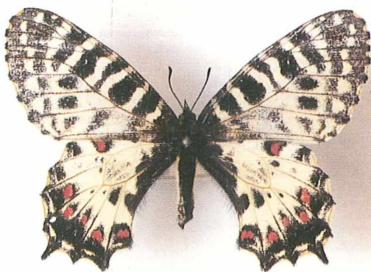
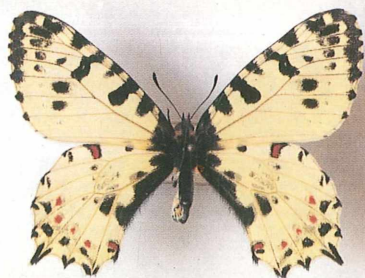
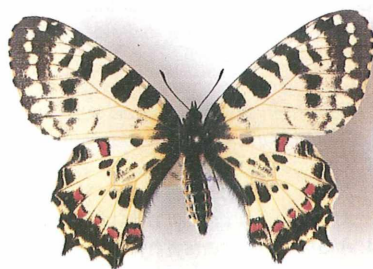
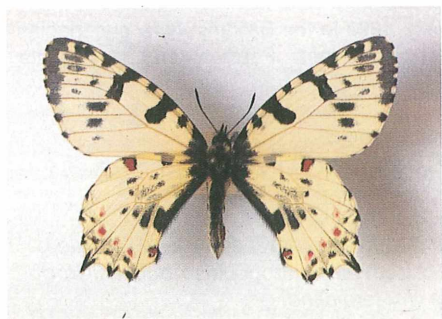
Fig. 6: *Allancastris cerisyi ferdinandi* ♀, Greece, Thrace, Souflion

Fig. 7: *Allancastris cerisyi dalmacijae* subsp. nov., holotype ♂

Fig. 8: *Allancastris cerisyi dalmacijae* subsp. nov., paratype ♀

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Colour plate II



Colour plate III

SALA, G. & M. BOLLINO: *Allancastris cerisyi* GODART, 1822 in the Balkans: New subspecies and critical notes on the existing populations (Lepidoptera, Papilionidae). *Atalanta* **25**(1/2):151 – 160.

Fig. 9: *Allancastris cerisyi huberi* subsp. nov., holotype ♂

Fig. 10: *Allancastris cerisyi huberi* subsp. nov., paratype ♀

Fig. 11: *Allancastris cerisyi huberi* subsp. nov., paratype ♀

Fig. 12: *Allancastris cerisyi huberi* subsp. nov., paratype ♀, yellow form

Fig. 13: *Allancastris cerisyi* hybrid ♂: *ferdinandi* ♂ from Alexandropoulos x *dalmacijae* ♀

Fig. 14: *Allancastris cerisyi* hybrid ♀: *ferdinandi* ♂ from Alexandropoulos x *dalmacijae* ♀

Fig. 15: *Allancastris cerisyi* hybrid ♂: *dalmacijae* ♂ x *ferdinandi* ♀

Fig. 16: *Allancastris cerisyi* hybrid ♀: *dalmacijae* ♂ x *ferdinandi* ♀.

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Colour plate III

